WE CLAIM AS OUR INVENTION:

1. An imaging tomography apparatus comprising:

a first data acquisition system comprising a first radiator and a first data acquisition unit for detecting radiation originating from the first radiator;

a second data acquisition system, comprising a second radiator and a second data acquisition unit for detecting radiation originating from the second radiator;

a gantry at which said first and second data acquisition systems are mounted for rotating said first and second data acquisition systems around an examination subject and around a common rotation axis, with a constant angular separation between said first and second data acquisition systems in an azimuthal direction relative to said common rotation axis; and

an arrangement for allowing radiation from only one of said first and second radiators to reach said examination at a time, in alternation, during rotation of said first and second data acquisition systems.

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2. An imaging tomography apparatus as claimed in claim 1 wherein said first radiator is a first x-ray radiator, said first detector is a first x-ray detector, said second radiator is a second x-ray radiator and said second detector is a second x-ray detector, and wherein each of said first and second data acquisition systems produces computed tomography projection data.

3. An imaging tomography apparatus as claimed in claim 1 wherein said arrangement comprises a control unit connected to each of said first and second data acquisition systems for operating said first and second data acquisition systems in alternation.

4. An imaging tomography apparatus as claimed in claim 3 wherein said control unit alternatingly activates said first and second radiators.

5. An imaging tomography apparatus as claimed in claim 3 wherein said control unit alternatingly activates said first and second data acquisition units.

6. An imaging tomography apparatus as claimed in claim 3 wherein said control unit activates said first and second data acquisition units respectively in synchronization with activation of the respective first and second radiators associated therewith.

7. An imaging tomography apparatus as claimed in claim 2 wherein said arrangement is a control unit connected to said first and second data acquisition systems, and wherein said control unit receives, from said first and second data acquisition systems projection data in succession from a plurality of different projection directions, said projection data being alternatingly generated by said first and second data acquisition systems during rotation around said examination subject.

8. An imaging tomography apparatus as claimed in claim 1 wherein said arrangement comprises a first diaphragm device for gating said radiation from said first radiator and a second diaphragm device for gating said radiation from said second radiator, said first and second diaphragm devices being operated to gate the respective radiation in alternation.

9. An imaging tomography apparatus as claimed in claim 1 wherein said arrangement comprises an image computer connected to said first and second data acquisition units, said image computer receiving raw data from each of said first and second data acquisition units and reconstructing an image from said raw data, said image computer using only said raw data from said first data acquisition unit

acquired when said radiation from said first radiator irradiated said examination subject, and using only said raw data from said second data acquisition unit acquired while said radiation from said second radiator irradiated said examination subject.

10. A method for operating an imaging tomography apparatus comprising the steps of:

rotating a first data acquisition system, having a first radiator and a first data acquisition unit, and a second data acquisition system, having a second radiator and a second data acquisition unit, around an examination subject, around a common rotation axis, while maintaining a constant angular separation between said first and second data acquisition systems in an azimuthal direction relative to said common rotation axis; and

operating said first and second data acquisition systems to irradiate said examination subject with radiation from only one of said first and second data acquisition systems at a time, in alternation, during rotation of said first and second data acquisition systems.

11. A method as claimed in claim 10 comprising alternating irradiation of said examination subject multiple times during each rotation of said first and second data acquisition systems around said examination subject.

12. A method as claimed in claim 10 wherein said first radiator is a first x-ray radiator, said first data acquisition unit is a first x-ray detector, said second radiator is a second x-ray radiator and said second data acquisition unit is a second x-ray detector, and comprising obtaining projection data from examination subject with said first and second data acquisition systems and reconstructing a computed tomography image from said projection data.

13. A method as claimed in claim 12 comprising successively acquiring said projection data with each of said first and second data acquisition system from a plurality of different projection directions, and acquiring said projection data in alternation corresponding to the alternation of the irradiation of the examination subject.

14. A method as claimed in claim 12 comprising alternating irradiating said examination subject by alternatingly activating said first and second radiators.

15. A method as claimed in claim 12 comprising alternatingly activating said first and second data acquisition units.

16. A method as claimed in claim 15 comprising alternatingly activating said first and second data acquisition units synchronized with alternating activation of said first and second radiators.